

Case Study

MacDermid Incorporated

What a great success story!!! MacDermid Incorporated, a manufacturer of specialty chemicals in Ferndale, Michigan has been able to reduce the cost of producing chemicals by almost 50% in the last 3 years. This didn't just happen. In addition to their own ideas, the management invited the Retired Engineer Technical Assistance Program, offered by the Michigan Department of Environmental Quality, to conduct a waste reduction assessment of their facility in late 1995. This service is confidential, non-regulatory and free. Even though the assessment report is entirely confidential, the company was gracious enough to give us permission to publish this case study.

Three retired engineers conducted the assessment on October 25 and 26, 1995. Now that over 3 years have elapsed since the assessment, the results of the actions taken by the company are well documented. As Don LaBelle, the site manager said, "it has been worth millions of dollars to us."

What exactly did the team recommend and what did the company do about it?

Before answering that question, let's look at the company. MacDermid is a producer of about 600 different specialty chemicals for chemical treatment, surface preparation, and finishing of metals, plastics and other materials. They do this in a 110,000 square foot plant with about 40 employees. MacDermid is a division of MacDermid, Incorporated in Waterbury, Connecticut.

The following examples illustrate the progress made under the leadership of Mr. La Belle and Mark Byrne, the Technical Manager at MacDermid.

Water and Water Treatment

A lot of water is used in making the chemicals produced by MacDermid. One of the most important recommendation was that MacDermid change the water system to a closed loop system and work toward a zero industrial water discharge to the sewer. Along with this recommendation, it was suggested that they work toward reducing the number of chelates to eliminate or reduce the cost of untreatable water. MacDermid has not yet reached zero discharge, but by changing to a point source reduction system, they have been able to capture washouts and use them in the next batch. This made it possible to drastically reduce the water treatment chemicals. Also, they switched from powdered raw materials to liquid and crystal, which eliminated the problem of powder getting into the scrubbers. These changes reduced the cost of the water treatment chemicals by over \$100,000/year in addition to the reduced cost of water purchased from the Ferndale Water System. Further, the cost of disposing of untreatable water has been reduced from \$25,000/year to \$8,000/year.

Electrical Power

As would be expected in a plant of this size producing chemicals, the electrical energy costs were high. It was recommended that MacDermid contact Detroit Edison to determine power factor, load factor and causes of demand charges and work with them to reduce power costs and get a more beneficial rate schedule. Since that time, a second transformer has been installed and other steps taken to reduce the energy usage. One of the tangible results is that the power factor is now .98, which is extremely high.

Part of the recommendation for reducing power usage was to implement an EPA Green Light program. MacDermid has disconnected ½ of the lights in the office area and is now changing from T-12 to T-8 fluorescent lights with electronic ballasts in the plant area. They recently added a warehouse addition to the plant and installed Halide lighting with motion detectors in this area. Overall, the energy costs have been slightly reduced while production has more than doubled.

Gas Heat

In order to reduce gas consumption and cost, MacDermid installed infrared heaters in the shipping area. This was done instead of using plastic curtains at the docks because it was found that plastic curtains tore and wore out quickly. The cost of gas has been reduced from \$42,000/year to \$30,000 since making this change.

Packaging

One of the major cost savers that also reduced waste going to landfill was to change the packaging situation. MacDermid is now reusing plastic drums that are appropriate to their packaging needs and sending the remainder to a recycler. However, they are buying used drums from the recycler instead of using new ones for most of the remainder of the drum requirements. This change alone accounts for a savings of \$150,000/year in drum costs and prevents much waste from going to landfill. In addition, MacDermid was able to reduce the cost of trash and sludge \$9,000/year by recycling cardboard and paper and by asking vendors to change their packaging.

The Bottom Line

The above changes and others have made a remarkable change in the cost of producing chemicals at MacDermid Incorporated. Overall, the cost of producing a pound of chemicals has been reduced by about 50% in the last 3 years. When you consider that the plant produces 45 million pounds of specialty chemicals/year, it is easy to see why Mr. LaBelle says the assessment was worth millions to them.

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